

## RESPONSE to Reviewer #1

We would like to thank you a lot for your time to evaluate our manuscript and for your valuable feedback. Below you may find our replies to your comments written with blue colour. New or changed sentences in our manuscript are also provided (in black colour/italics).

### **Minor comments**

1. Line 309: Looking at Figure 3b, the fine mode fraction is higher than 75% rather than the 80% in the paper

**REPLY:** Thank you, it has been corrected.

**Lines 298-300:** *“According to the collocated sunphotometer measurements, the AOD at 500 nm does not exceed the value of 0.15 and the fine aerosol fraction is higher than 75% (Fig. 3b).”*

2. Line 358: What is the retrieval uncertainty of the AERONET size distribution, and does the optimum retrieval fall within this uncertainty?

**REPLY:** As described in Dubovik et al. (2000), the relative retrieval error of the volume size distribution of water soluble particles, with radius in the range of 0.1-7  $\mu\text{m}$ , is 15%. The differences between GRASP/GARRLiC and AERONET retrievals are larger than this threshold for some of the cases analyzed.

We inserted the following in line 373: *“The differences between GRASP/GARRLiC and AERONET retrievals are larger than 15% (i.e., the retrieval uncertainty of the AERONET product provided by Dubovik et al. (2000) for water-soluble particles with radius in the range of 0.1-7  $\mu\text{m}$ ), for a number of cases analyzed.”*

### **Reference**

Dubovik, O., Smirnov, A., Holben, B., King, M., Kaufman, Y., Eck, T., and Slutsker, I.: Accuracy assessments of aerosol optical properties retrieved from Aerosol Robotic Network (AERONET) Sun and sky radiance measurements, *J. Geophys. Res.-Atmos.*, 105, 9791–9806, <https://doi.org/10.1029/2000jd900040>, 2000.

3. Line 382: Likewise, what are the retrieval uncertainties for the AERONET results shown in Figure 10?

**REPLY:** See reply of previous comment.

4. Line 384: What results are not statistically significant? Do you mean the differences in the size distribution between stations are not statistically significant??

**REPLY:** We mean that the number of cases presented are not sufficient for characterizing the atmospheric state above Europe during the COVID-19 lockdown and relaxation period.

We changed lines 373-374 accordingly: *“Due to the low number of cases, the results are not statistically significant in order to characterize the atmospheric state over Europe during the COVID-19 lockdown and relaxation period.”*

5. Line 390: The symbols in Figure 12a are hard to distinguish.

**REPLY:** Thank you for the suggestion. We updated Fig. 12a, using the following plots:

